

Anticipated Futures for Modern Rural Economies - a Request for Guidance by Research, Policy and the Business Community

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ABSTRACT

This paper builds on a review of literature and EU policies for rural development, innovation, entrepreneurship and the bio-based economy. It provides a basis for conceptualizing modern rural economies dealing with food, bio-based value chains, and valorization of ecosystem services regarding future conditions for rural entrepreneurship (including agriculture), remote areas (including those in coastal areas), and urban-rural integration. It will outline emerging opportunities to promote diversification, shared values, innovation, and resource conservation, and to reach a common understanding of the solutions to set up a “Modern Rural Economy” in different conditions. In general, there are many opportunities for rural development, many of them linked to emerging technologies which reduce the relevance of distance in marketing, sales and many other activity domains and to business opportunities evolving within the bio-economy and ecosystem services. However, it becomes obvious that the realization of opportunities needs to build on the simultaneous engagement of various stakeholders in business development, research, and public administration. Successful developments require an integrated development approach which combines opportunities into a comprehensive development program.

Keywords: Rural economy, bio-based economy; value chains; entrepreneurship

1 Introduction - trends in urbanization and rural development

Any discussion of rural economies is based on their role as an antipode to urban economies. Urban and rural developments are closely interrelated. The more people gather in cities and especially big and mega cities, the less people populate regions outside cities, i.e. rural environments. Going back in history, agriculture as the base activity in rural regions with human production activities required many people for the production of sufficient food that could serve the urban population. With the increase in agricultural productivity, more and more people could leave agriculture and move to cities where non-agricultural employment opportunities and services were available.

The industrial revolution with its factory model was able to absorb the population coming from agriculture but also increased the move towards a concentration of people in city locations. The move was and is supported by the availability and development of services of various kind in cities where they can build on a broad customer base which often is a pre-condition for making them feasible and economic viable. Such services may refer to education (schools and universities), shopping, entertainment and many others. Today, these comparative advantages are still in place or are even being developed further as, e.g. digital services or digital communication networks are first available in densely populated areas.

As the world continues to urbanize, a sustainable development of rural areas needs to offset the negative impact of a declining population on the rural infrastructure, the loss of services, and in general, the rural living conditions.

Appropriate policies might be able to reduce the trend towards urbanization or at its best, might even be able to reverse the trend, reducing the pressure on urban growth and on rural decline. The paper evolved out of the European RUBIZMO project (<https://rubizmo.eu>) and aims at consolidating different views and at contributing towards developing appropriate guidance on how to move forward in promoting the uptake of rural areas through innovative initiatives, the exploitation of rural competitive advantages characterized a.o. by new development in bio-economy, the elimination of development barriers facilitated by a.o. new developments in digitization, the promotion of entrepreneurship, and the facilitation of collaboration within the broad range of stakeholders with interest in rural development. Emerging developments in technology, science or business activities may even offer the opportunity for reversing the trend towards urbanization.

2 Rural revival towards future rural economies

2.1 Overview

In this paper we limit ourselves to rural areas outside urban areas, either adjacent or not. Rural areas adjacent to urban areas can, if managed appropriately, utilize benefits of urban and rural environments while avoiding the disadvantages of both. Such rural areas are coined by FAO as *urban-rural continuum* (FAO, 2016) where, depending on an increasing distance to the urban centers, the influence (benefits and disadvantages) of the urban environment is decreasing. The attractiveness of an urban-rural continuum depends not the least on the availability of highly developed mobility concepts for utilizing the benefits of being close to the urban center and of an appropriate mixture with the development opportunities identified for rural areas.

Rural development opportunities build on a common range of emerging alternatives from which they can draw, and which they could utilize in line with their specific strengths and deficiencies. As no individual rural area is similar to any other rural area, the suitable utilization of emerging development alternatives might differ. In the end, the suitable utilization of alternatives will eliminate deficiencies and develop strengths which, together will lead to a number of scenarios that can be anticipated as futures for rural economies, being either adjacent to urban areas or not.

2.2 Emerging opportunities

Emerging opportunities are opportunities that allow rural areas to reduce or eliminate disadvantages or to strengthen or utilize (potential) advantages in comparison with urban area.

Classical disadvantages are all connected to

- a) the low density of population (also due to the lack of jobs) which does not allow a viable offer of services of all kind in rural areas and
- b) the longer distance to urban centers combined with poor mobility services which do not allow, as a potential alternative to rural services, the utilization of service offers available in the city.

Potential advantages are connected to the quality of the natural environment, the availability of renewable resources, and the closer link with the production and delivery of food. The primary emerging opportunities focus on business opportunities that create employment and developments that offset the distance to urban centers. They include primarily

- a) the utilization of new *information and communication technology* which reduces the relevance of space and provides platforms for communication, knowledge exchange, and service deliveries,
- b) the development of the *bio-economy based on renewable resources* which has the potential for creating a bio-industry with strong rural base, and
- c) the activation and valorization of *ecosystem services* for the protection and prosperity of the environment and its utilization for touristic activities.

These emerging opportunities are ready for being used. It is necessary to engage research, entrepreneurs, policy, and administration for integrating the opportunities to innovative solutions that best fit the rural needs and scenarios and have the potential for being accepted on a larger scale.

3 Specific development opportunities

3.1 Information and logistics technology

Continuing improvements in information and communications technologies are making physical location less important when it comes to utilizing services of all kind and of conducting business.

However, efforts and innovative ideas are necessary for transforming principal alternatives into fitting applications. It all starts with the need for high-speed internet services on which new and innovative business models in the various application domains could build. This asks for extensive policy support as investments in high speed internet services in rural area with their still lower population density are less attractive from a business perspective than investments in urban areas.

Traditionally, the rural business focus was on local or regional issues, while urbanization was considered as being linked with globalization. However, with the new developments in telecommunications and logistics technology the rural limitations in outreach are disappearing. Global logistics services may have their hubs or warehouses in rural regions as has been demonstrated by global actors such as amazon^{Reg} with its online sales and product distribution services.

3.2 Bio-economy with renewable resources

In Bio-economy, bioprocesses convert plant based renewable resources into a range of bio-based industrial products, including renewable fuels, plastics, paper, building material, insulation material, chemicals but also enzymes, vitamins or minerals (Agrobiobase, 2018). An excerpt which can only cover parts of alternatives is summarized in table 1.

Table 1.
Bio-economy alternatives based on renewable resources.

Crops	Products	Focus
A selection of utilized crops: Miscanthus, grass, hemp, sunflower, wheat, bamboo, Oilseed rape, cannabis, poppy, Potatoes, maize, lavender, algae, trees, etc. but also residues such as cereals straw, silo dust, chaff, corn cobs, pruning, grape marc, olive pits, bio waste, etc.	Bioethanol, biodiesel, pellets, etc.	Biofuels, bioenergy
	Building blocks, insulation, paints, varnishes	Building, construction
	Paper, packaging, rope, fabric, padding	Fiber
	Drugs, medicine, vitamins, minerals, nutritional supplements	Pharmaceuticals
	Plastics, packaging	Biopolymers
	Oils, Enzymes, printing ink, paper, coatings	Chemicals
	Protein through insect growth on bio-waste	Feed

As the table indicates, there is already a great variety of applications going on, either in pilot plants or first market oriented business activities. They are typically characterized by close cooperation between research and the business community.

Bio-economy developments based on renewable resources and especially on resources from plant production have a natural drive towards rural areas where plant production and harvesting takes place. Logistics considerations favor a move of processing plants with lower volume output to the rural area which avoids transportation of the source bulk product over longer distances. This could lead to a “*soft re-industrialization*” of rural areas. However, this drive can only have an impact if met by market pull and consumer demand. To support the growing market, it needs the development of a distribution infrastructure while at the same time providing education possibilities, services, housing etc. of a level that can attract employees to move from the urban centers to the rural environment.

3.3 Ecosystem services

The term ecosystem services covers a broad range of services supporting a specific system environment. In our context we concentrate on the services as discussed in the *Millennium Ecosystem Assessment* framework (Millennium, 2003). It identified ecosystem services within four categories: provisioning services, such as food and water, regulating services, such as flood and disease control, supporting services, such as nutrient cycling, that maintain the conditions for life on Earth, and cultural services, such as spiritual, recreational, and cultural benefits (see also Ecosystem, 2009).

In principle, ecosystem services are a traditional element of rural activity. However, the growing interest in environmental issues and climate change combined with an increasing interest of the urban population in touristic activities linked to nature and rural environment makes the development of appropriate ecosystem services an important factor in rural development. Hiking, cycling, and other outdoor activities gain increasing attention and support the development of a *sustainable touristic industry* based on ecosystem services.

3.4 Concluding summary

There are many opportunities for rural development, many of them linked to emerging technologies and business opportunities evolving within the bio-economy. However, from the principal analysis one can identify two considerations, planning and action, which are the foundation for assuring a successful and sustainable development:

1. *Comprehensive planning*. It is obvious that successful **developments** require an integrated development approach which combines opportunities into a comprehensive development program. As an example, developments towards a bio- economy based on renewable resources needs the availability of appropriate infrastructures in information technology and logistics when the market has started to grow because of consumer demands. Then it is important to offer basic services such as basic education opportunities necessary to attract a working force for a growing community.
2. *Multi-actor engagement*. It is obvious that the **utilization** of the emerging opportunities for a revival of rural areas requires joint and simultaneous efforts by a variety of stakeholders. Research need s to design feasible and appropriate production and service solutions, the business community needs to innovate and act while policy and rural development agencies need to provide a sustainable basis of infrastructures especially connected to the emerging information and communication technology but also involving infrastructures in logistics and basic services for community operations.

4 Pathways towards modern rural economies

Within Europe there are many examples of rural development initiatives that build on one or several of the development opportunities outlined in this paper.

Many initiatives are linked to European programs and projects which generate and support rural development initiatives. There are about 118 programs (https://ec.europa.eu/agriculture/rural-development-2014-2020_en; 26.03.2019) in support of rural development formulated for the period 2014-2020. They are usually focused on specific development opportunities but cover a broad range of alternative realizations.

As an example, the Rubizmo project (<https://rubizmo.eu/>) has analyzed in detail a number of development initiatives from across Europe. The examples allow some generalizations and the delineation

of clusters that characterize development paths from early cooperation among stakeholders to a comprehensive rural development initiative as a model for a future rural economy.

5 General observations

When analyzing the different examples of envisaged or experimental views on future modern rural economies, some commonalities can be identified:

1. *Focus*. The majority deal with the collection, communication or use of information, partly through online, partly through classical offline means. The offline means can be considered as intermediate steps towards a digital communication infrastructure. Information activities are drivers for rural development which, however, require public investments for providing an information infrastructure that meets the needs and probably increasing needs of the initiated information activities.
2. *Collaboration*. The development initiatives are primarily driven by collaborations between enterprises or collaboration between enterprises and research. Specific policy engagements are not at the core but are responsible for providing a suitable collaboration environment such as a suitable information infrastructure or for acting as facilitator in cooperation developments.
3. *Objectives*. The initiatives are driven by a multitude of objectives. They are all linked to entrepreneurship. It is striking that initiatives towards promoting Public- Private-Partnerships are almost non-existent. This supports the impression, that public responsibility is primarily seen in its engagement for providing a suitable business environment and not in active entrepreneurial engagement.
4. *Sector*. Present rural development initiatives are primarily focused on supporting traditional agricultural and food related initiatives. They constitute the traditional rural strengths. However, while the new innovative developments in e.g. bio- economy, ecosystem services, or tourism are still scarcely represented in rural development initiatives, they represent the initiatives that reach “beyond traditional development paths” and could, if supported appropriately, provide additional momentums for rural development.

In **summary** one can conclude from ongoing development initiatives that anticipated futures for modern rural economies will have a strong base on business engagements and collaborations linked to research competences, supported by and engaged in a strong information (digital) environment provided by public infrastructural engagements. While the initiating development initiatives seem to primarily concentrate on classical rural strengths linked to agriculture and food, new windows of opportunities will allow new sectors related to bi-economy, eco- services and other opportunities with rural comparative development advantages to emerge as demonstrated by first reported initiatives.

6 Categorization of cluster developments

The need for cooperation is at the base of all development initiatives and is a prerequisite for being able to move forward. This is in line with the European quest for a “multi-actor” development approach (<https://ec.europa.eu/eip/agriculture/en/news/brochure-“multi-actor-approach”>; 26.03.2019). However, cooperation is not easy to develop and needs time to reach a higher level of intensity. In analyzing the project examples, we can distinguish between the following engagements in moving towards future rural economies:

1. Visions and blueprints towards future rural economies
2. Focused initiatives as basis for future-oriented but narrow development lines
 - a. Building on agriculture as the backbone of rural competitive advantage
 - b. Establishing communication networks as base for cooperation initiatives
 - c. Individual initiatives with potential broad impact for rural development
3. Comprehensive rural development initiatives as models for the future.

7 Implications for research, policy, and the business community

The discussion of opportunities and development initiatives underlines the need for concerted action of all stakeholders with interest in realizing opportunities, in rural development, and, as people, in a move to rural areas. The broad range of opportunities and their early realizations as presented in the example

initiatives build on the availability of suitable research results, of an appropriate infrastructure, beginning with suitable telecommunication networks, but also on appropriate mobility schemes and basic services in schooling and other public services.

Rural development towards attractive futures asks for coordinated and concerted program initiatives that provide the infrastructural basis for the business community to be able to invest and act and for people to move. Most opportunities discussed for moving the rural areas towards a modern future economy are linked to business initiatives that build on developments that differ from previous developments and can rarely build on established experience. The development of new production chains building on plant-based resources, the development of online-based marketing, sales, and distribution systems involving state-of-the-art technologies or new attractive ecosystem services that reach beyond classical "environment protection schemes" are not the base activity of the classical business community.

They are to a large extent the activity domain of newly established companies or new subsidiaries which are dependent on newly emerging knowledge and technology transfer through cooperation with research or through networking with other stakeholders in the business domain. Two issues emerge as necessary for success:

1. Rural development agencies gain little in trying to motivate established business actors of the "classical" economy to moving their business activity into the rural environment but should support the uptake of innovative business actors who build on the emerging opportunities from the very beginning.
2. For making innovations especially in the utilization of plant-based resources (but also in ecosystem services) a success, enterprises need to build not just on their own business activity but need to organize new value chains that support the business activity from early production to markets and consumers. This asks for the establishment of new networking activities and the availability of financial and advisory support.

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